In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously presented) A lensless method for measuring the amount which an object to be measured has moved in a plane and back-and-forth using a granular speck pattern generated by a reflecting laser beam in non-contact fashion comprising steps of:

irradiating an object to be measured with a laser beam;

directly detecting the granular speck pattern generated by the reflecting laser beam by a detector and using the detected speck pattern as an index;

moving the object toward or away from the detector;

calculating the amount of movement of the object based upon the movement of a new granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

2. (Previously presented) A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector to generate a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor to directly pick up without a lens said granular speck pattern used as an index;

an A/D converter coupled to said line sensor to convert an analog signal supplied from said line sensor to a digital signal;

a processing unit coupled to the A/D converter to calculate the amount of movement of said object toward and away from said sensor on the basis of movement of the granular speck in said pattern with respect to a change in the pixel interval of said granular speck pattern picked up by said line sensor and represented by said A/D converted signal; and

a display coupled to said processing unit to display the amount of movement calculated by said processing unit.

3. (Previously presented) The apparatus as defined in claim 2 and further including a light shield positioned in front of said line sensor.

4. (Currently amended) The apparatus as defined in claim 3 wherein said ~~line sensor~~ light shield comprises a tube.

5. (Original) The apparatus as defined in claim 4 wherein said tube is cylindrical.

6. (Previously presented) A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector for generating a granular speck pattern corresponding to the surface of an object to be measured;

a line sensor positioned to detect directly without a lens said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object toward and away from said sensor on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said electrical circuit.

7. (Previously presented) A lensless method for measuring the amount which an object to be measured has moved by detecting a granular speck pattern reflected by a laser beam comprising steps of:

irradiating an object to be measured with a laser beam;

directly detecting a granular speck pattern generated by the reflecting laser beam by a detector and using the detected pattern as an index;

moving the object with respect to said detector;

calculating the amount of movement of the object based upon movement of the granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

8. (Previously Presented) A lensless apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser source for generating a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor positioned to detect directly without a lens said granular speck pattern as an index;

a processing unit coupled to said line sensor to calculate the amount of movement of said object on the basis of movement of a granular speck in said granular speck pattern with respect to a pixel interval of said granular speck pattern detected by said line sensor; and

a display coupled to said processing unit to display the amount of movement calculated by said processing unit.

9. (Previously presented) The apparatus as defined in claim 8 and further including a light shield positioned in front of said line sensor.

10. (Currently amended) The apparatus as defined in claim 9 wherein said ~~line sensor~~ light shield comprises a tube.

11. (Original) The apparatus as defined in claim 10 wherein said tube is cylindrical.

12. (Original) The apparatus as defined in claim 8 and further including an A/D converter coupled to said line sensor to convert an analog signal supplied from said line sensor to a digital signal.

13. (Previously presented) A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a collimated light source for generating a granular speck pattern corresponding to the surface of an object to be measured;

a line sensor positioned to detect directly without a lens said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said electrical circuit.

14. (Original) The apparatus as defined in claim 13 wherein said collimated light source is a laser.

15. (Previously presented) The apparatus as defined in claim 14 and further including a light shield positioned in front of said line sensor.

16. (Currently amended) The apparatus as defined in claim 15 wherein said ~~line sensor~~ light shield comprises a tube.

17. (Original) The apparatus as defined in claim 16 wherein said tube is cylindrical.

18. (New) The method as defined in claim 1 and further including positioning a light shield in front of said detector.

19. (New) The method as defined in claim 18 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

20. (New) The apparatus as defined in claim 3 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

21. (New) The apparatus as defined in claim 6 and further including a light shield positioned in front of said line sensor.

22. (New) The apparatus as defined in claim 21 wherein the light shield does not interfere with the granular speck pattern detected by said line sensor.

23. (New) The method as defined in claim 7 and further including positioning a light shield in front of said detector.

24. (New) The method as defined in claim 23 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

25. (New) The apparatus as defined in claim 9 wherein the light shield does not interfere with the granular speck pattern detected by said line sensor.

26. (New) A method for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam in non-contact fashion comprising steps of:

irradiating an object to be measured with a laser beam;

directly detecting the granular speck pattern generated by the reflecting laser beam by a detector in an environment, the environment not being a darkroom, and using the detected speck pattern as an index;

calculating the amount of movement of the object based upon the movement of a new granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

27. (New) The method of claim 26 further comprising moving the object toward or away from said detector.

28. (New) The method as defined in claim 26 and further including positioning a light shield in front of said detector.

29. (New) The method as defined in claim 28 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

30. (New) An apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector to generate a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor to directly pick up said granular speck pattern used as an index;

an A/D converter coupled to said line sensor to convert an analog signal supplied from said line sensor to a digital signal;

a processing unit coupled to the A/D converter to calculate the amount of movement of said object on the basis of movement of the granular speck in said pattern with respect to a change in the pixel interval of said granular speck pattern picked up by said line sensor and represented by said A/D converted signal; and

a display coupled to said processing unit to display the amount of movement calculated by said processing unit;

wherein the line sensor is able to directly pick up the granular speck pattern in an environment that is not a darkroom.

31. (New) The apparatus as defined in claim 30 and further including a light shield positioned in front of said line sensor.

32. (New) The apparatus as defined in claim 31 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

33. (New) The apparatus as defined in claim 32 and further including a light shield positioned in front of said line sensor.

34. (New) An apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector for generating a granular speck pattern corresponding to the surface of an object to be measured;

a line sensor positioned to detect directly said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said processing unit;

wherein the line sensor is able to directly pick up the granular speck pattern in an environment that is not a darkroom.

35. (New) The apparatus as defined in claim 34 and further including a light shield positioned in front of said line sensor.

36. (New) The apparatus as defined in claim 35 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

37. (New) The apparatus as defined in claim 36 and further including a light shield positioned in front of said line sensor.

38. (New) A method for measuring the amount which an object to be measured has moved by detecting a granular speck pattern reflected by a laser beam comprising steps of:

irradiating an object to be measured with a laser beam;

directly detecting a granular speck pattern generated by the reflecting laser beam by a detector in an environment, the environment not being a darkroom, and using the detected pattern as an index;

moving the object with respect to said detector;

calculating the amount of movement of the object based upon movement of the granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

39. (New) The method of claim 38 further comprising moving the object toward or away from said detector.

40. (New) The method as defined in claim 38 and further including positioning a light shield in front of said detector.

41. (New) The method as defined in claim 40 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

42. (New) An apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser source for generating a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor positioned to detect directly said granular speck pattern as an index;

a processing unit coupled to said line sensor to calculate the amount of movement of said object on the basis of movement of a granular speck in said granular speck pattern with respect to a pixel interval of said granular speck pattern detected by said line sensor; and

a display coupled to said processing unit to display the amount of movement calculated by said processing unit.

wherein the line sensor is able to directly pick up the granular speck pattern in an environment that is not a darkroom.

43. (New) The apparatus as defined in claim 42 and further including a light shield positioned in front of said line sensor.

44. (New) The apparatus as defined in claim 43 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

45. (New) The apparatus as defined in claim 44 and further including a light shield positioned in front of said line sensor.

46. (New) An apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a collimated light source for generating a granular speck pattern corresponding to the surface of an object to be measured;

a line sensor positioned to detect directly said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said electrical circuit;

wherein the line sensor is able to directly pick up the granular speck pattern in an environment that is not a darkroom.

47. (New) The apparatus as defined in claim 46 and further including a light shield positioned in front of said line sensor.

48. (New) The apparatus as defined in claim 47 wherein said light shield does not interfere with said granular speck pattern detected by said detector.

49. (New) The apparatus as defined in claim 48 and further including a light shield positioned in front of said line sensor.